3.5 Load factors and load combinations

3.5.1 General

Add to **Table 3.1 Load factors and load combinations** the following:

	Permanent Loads				Transitory Loads				Exceptional Loads			
Loads	**D**	**E**	**P**	**L***	**K**	**W**	**V**	**S**	**EQ**	**F**	**A**	**H**
Ultimate Limit States‡												
ULS Combination 5A* **	α_D	α_E	α_P	**λ**	**0**	**0**	**0**	**0**	**1.00**	**0**	**0**	**0**

*** For long spans in Seismic performance zones 3 and 4, either continuous or semi-continuous for live load, with any one span or combination of spans greater than 200 metres in length. **λ** shall be equal to 0.50 unless consented to otherwise by the Ministry,

Commentary: *For long-span bridges classified as lifeline bridges in accordance with Clause 4.4.2, partial live load shall be included in ULS Combination 5A. Effects of live load on bridge inertia mass for dynamic analysis need not to be considered for this special load case.*

If a vertical design spectrum is considered explicitly in a site-specific study, the load factor for dead load, α_D*, shall be taken as 1.0 in ULS Combination 5 and 5A.*

For long-span lifeline bridges, presence of partial live load during a major seismic event shall be considered. Application of Turkstra's rule for combining uncorrelated loads indicates that 50% of live load is reasonable for a wide range of values of average daily truck traffic (ADTT). This issue has been considered for the first time in the third edition of the AASHTO LRFD Bridge Design Specifications, 2004.

The maximum (1.25) and minimum (0.8) values of load factor for dead load, α_D*, are intended to account for, in an indirect way, the effects of vertical accelerations. If these effects are considered explicitly by using a vertical design spectrum, the load factor for dead load,* α_D*, should be taken as 1.0.*

3.6 Dead loads

Dead loads shall include an allowance for a future 50 mm concrete overlay over the full area of the bridge deck to account for future deck rehabilitation and also to partially account for any unanticipated dead loads that may be added to the structure following construction.

For bridges with waterproof membrane and asphalt overlay on a concrete deck, the minimum dead load for design shall include the design asphalt thickness or 100 mm of asphalt, whichever is greater.

Add to **Table 3.3 Unit material weights** the following:

Material	Unit Weight, kN/m^3
Wood	
Untreated Douglas Fir	5.4
Creosote treated sawn timber and glulam, >114 mm	6.6
Creosote treated truss chords, < 114 mm	7.0

Commentary: *There is no reference to treated timber dead weight for Douglas Fir.*

3.8 Live loads

3.8.3 CL-W loading

3.8.3.1 General

BCL-625 is the designated live load for all BC bridges unless Approved otherwise.

3.8.3.2 CL-W Truck

Delete the third paragraph and replace with the following:

In BC, a BCL-625 Truck, as detailed in Figure 3.2(a) shall be used.

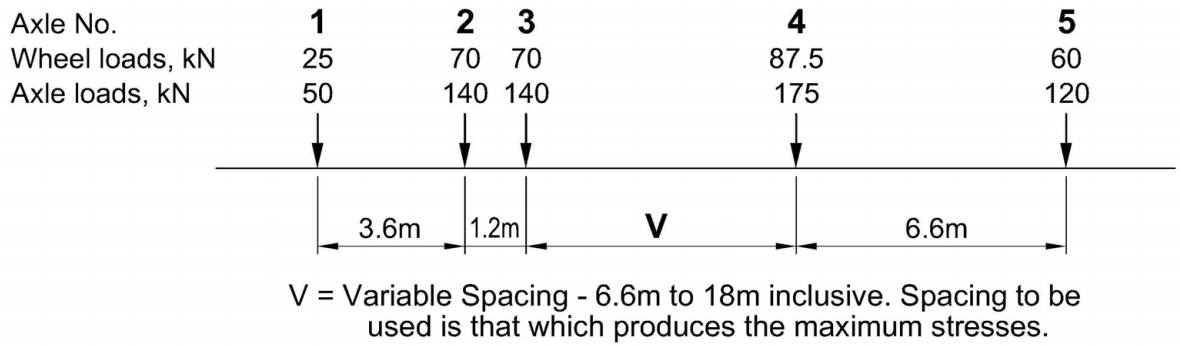
Note: *The total load of the BCL-625 Truck is 625 kN, but the axle load and distribution differs from that shown in Figure 3.2.*

Delete the fourth paragraph and replace with the following:

The CL-W and the BCL-625 Truck shall be placed centrally in a space 3.0 m wide that represents the clearance envelope for each Truck, unless otherwise specified by the Regulatory Authority or elsewhere in this Code.

Figure 3.2(a)

BCL-625 Truck



V = Variable Spacing - 6.6m to 18m inclusive. Spacing to be used is that which produces the maximum stresses.

Commentary: *Bridges designed to BCL-625 Live Load will have adequate load capacity for 85 tonne Class Permit Vehicles and 6 Axle Mobile Cranes with boom in cradle to travel with other traffic. CL-625 Loading is inadequate in short spans for Cranes and medium length continuous spans in moment for 85 tonne Class Permit Vehicles.*

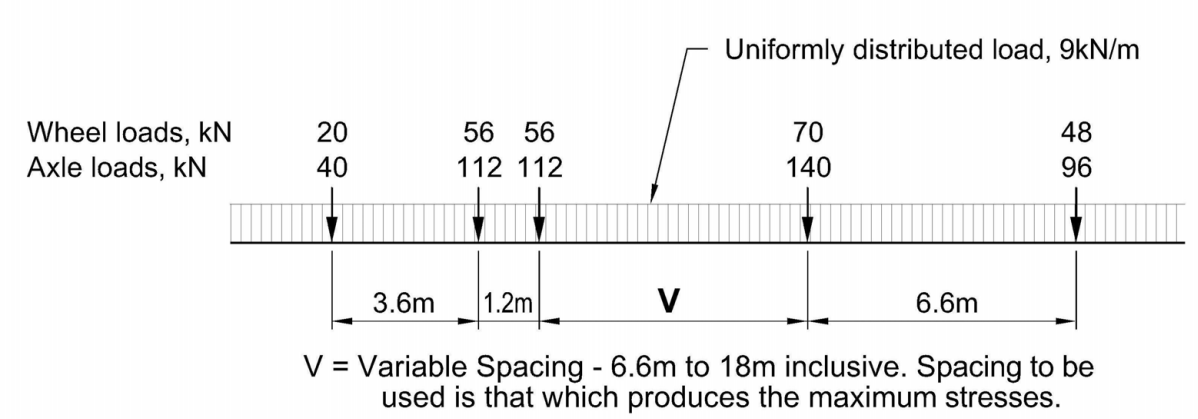
3.8.3.3 CL-W Lane Load

Delete the second paragraph and replace with the following:

In BC, a BCL-625 Lane Load as detailed in Figure 3.3(a) shall be used.

Figure 3.3(a)

BCL-625 Lane Load



Commentary: *Bridges designed to BCL-625 Live Load will have adequate load capacity for 85 tonne Class Permit Vehicles and 6 Axle Mobile Cranes with boom in cradle to travel with other traffic. CL-625 Loading is inadequate in short spans for Cranes and medium length continuous spans in moment for 85 tonne Class Permit Vehicles.*

3.8.4 Application

3.8.4.5 Dynamic load allowance

3.8.4.5.1 General

The use of dynamic load allowance factors other than specified requires written Approval.

3.13 Earthquake effects

Delete the second sentence and replace with the following:

The designer is to obtain specific site acceleration values, as referenced in Clause 4.4.3 of this Supplement.

3.14 Vessel collisions

3.14.2 Bridge classification

The Ministry shall determine the bridge classification for vessel collision design purposes.

3.16 Construction load and loads on temporary structures

3.16.1 General

It shall be the responsibility of the Contractor to ensure that loads developed as a result of the construction methods can be properly carried unless a specific construction methodology is required by the designer. Assumed construction staging and loads shall be indicated on the Plans by the designer if a specific methodology is required.

A3.3 Vessel collision

A3.3.2 Design vessel selection

A3.3.2.1 General

Replace the first sentence with the following:

Method II shall be used for "Class I" bridges, unless the Ministry determines that there is insufficient data to determine reliable probabilistic values. Method I or Method II may be used for "Class II" bridges.

Commentary: *The Ministry does not collect data on vessel type and passage frequency or collision frequency.*

A3.3.3.2 Probability of aberrancy

Replace the first sentence with the following:

The probability of vessel aberrancy, PA (the probability that a vessel will stray off course and threaten a bridge) shall be determined by the following approximate method:

Replace the definition of BR with the following:

BR = aberrancy base rate (0.6×10^{-4} for ships and 1.2×10^{-4} for barges)

Commentary: *The Ministry does not keep a data base of vessel collision with its structures. The values for BR are taken from AASHTO LRFD 2007 and are based on analysis of historical data for high use waterways.*